IN THE CLAIMS

Please cancel claims 1-35 without prejudice or disclaimer, and substitute new claims 36-70 therefor as follows:

Claims 1-35 (Cancelled).

36. (New) An expandable bladder for tyre-vulcanising apparatuses, having a toroidal conformation, comprising:

at least one first layer of a first elastomer material and one second layer of a second elastomer material different from said first elastomer material;

wherein said second layer is at a position radially external to said first layer;

wherein said first and second layers have an undulated interface profile; and

wherein said interface profile defines mechanical-engagement elements between the first and second elastomer materials.

37. (New) The bladder as claimed in claim 36, comprising at least one circumferential edge carrying anchoring tailpieces.

38. (New) The bladder as claimed in claim 36, wherein the interface profile has a wave height and a wave pitch in which the wave height is higher than or as high as one tenth of the wave pitch.

39. (New) The bladder as claimed in claim 38, wherein the wave height is higher than half the wave pitch.

40. (New) The bladder as claimed in claim 36, wherein said mechanical-engagement elements have portions of mutual undercut constraint.

41. (New) The bladder as claimed in claim 36, wherein a third layer of elastomer material cross-linked with at least said first elastomer material is disposed at a position radially internal to said first layer.

42. (New) The bladder as claimed in claim 36, wherein a fourth layer of elastomer material cross-linked with at least one of said first and second elastomer materials is disposed at a position radially external to said second layer.

43. (New) The bladder as claimed in claim 36, wherein said first elastomer material comprises a polymeric butyl base and said second elastomer material comprises a polymeric silicone base.

44. (New) A method of manufacturing an expandable bladder for tyre-vulcanising apparatuses, comprising the steps of:

preparing at least one first elongated element comprising a first raw elastomer material and at least one second elongated element including a second raw elastomer material having a different composition from that of the first elastomer material;

laying said first elongated element on said toroidal support in the form of coils wound around a geometric axis of said toroidal support so as to form a first layer of said first elastomer material;

laying said second elongated element on a toroidal support in the form of coils wound around the geometric axis of said toroidal support so as to form a second

layer of said second elastomer material at a radially external position to said first layer, said first and second layers having an undulated interface profile wherein said interface profile defines mechanical-engagement elements between the first and second elastomer materials; and

vulcanising said bladder.

45. (New) The method as claimed in claim 44, wherein said interface profile has a wave height and a wave pitch in which the wave height is at least as high as one tenth of the wave pitch.

46. (New) The method as claimed in claim 45, wherein the wave height is higher than half the wave pitch.

47. (New) The method as claimed in claim 44, wherein said mechanical-engagement elements have portions of mutual undercut constraint.

48. (New) The method as claimed in claim 44, wherein at least one of said first and second elongated elements has a flattened cross-section conformation.

49. (New) The method as claimed in claim 44, wherein at least one of said first and second elongated elements has a substantially triangular cross-section conformation.

50. (New) The method as claimed in claim 44, wherein at least one of said first and second elongated elements has a substantially trapezoidal cross-section conformation.

51. (New) The method as claimed in claim 44, further comprising a step of mutually coupling the first and second elongated elements in the longitudinal extension

of same for preparing a continuous strip-like element that is wound around the geometric axis of said toroidal support during the layering step.

52. (New) The method as claimed in claim 51, wherein the coupling step is carried out before the laying steps.

53. (New) The method as claimed in claim 51, wherein preparation of the continuous strip-like element comprises the steps of:

delivering the first elongated element through a first delivery member;

delivering the second elongated element through a second delivery member simultaneously with delivery of the first elongated element;

guiding the first and second elongated elements in converging direction with respect to each other toward a point of mutual coupling.

54. (New) The method as claimed in claim 53, wherein delivery of the first and second elongated elements takes place by extrusion through a first and a second extruders respectively, which are part of said first and second delivery members.

55. (New) The method as claimed in claim 51, wherein the continuous strip-like element is made by co-extrusion of the first and second elongated elements through the same extruder.

56. (New) The method as claimed in claim 51, wherein the coupling step is carried out simultaneously with winding of the strip-like element on the toroidal support at a point of mutual coupling between the elongated elements located on the toroidal support.

57. (New) The method as claimed in claim 51, wherein the coupling step is carried out simultaneously with winding of the strip-like element on the toroidal support at a point of mutual coupling between the elongated elements located upstream of the toroidal support.

58. (New) The method as claimed in claim 44, wherein the first and second elongated elements are simultaneously laid on the toroidal support at points mutually spaced apart in a circumferential direction.

59. (New) The method as claimed in claim 51, wherein following the coupling step, each of said elongated elements has a base portion integral with a base portion of the other elongated element, and at least one of said elongated elements has an apex transversely projecting from the base portion with respect to a mutual-alignment direction of the base portions.

60. (New) The method as claimed in claim 59, wherein the first and second elongated elements are coupled at mutually offset positions transversely of a direction of mutual alignment of the base portions so that each elongated element has said apex projecting in the opposite direction with respect to the apex of the other elongated element.

61. (New) The method as claimed in claim 59, wherein the apex of an elongated element is turned up against a base portion of the other elongated element.

62. (New) The method as claimed in claim 44, wherein laying of each of said first and second elongated elements comprises the steps of:

delivering the elongated element from a delivery member disposed close to the toroidal support to apply said elongated element onto the support itself;

giving the toroidal support a rotatory motion for circumferential distribution around the geometric rotation axis so that the elongated element is circumferentially distributed on the toroidal support; and

carrying out controlled relative transverse-distribution displacements between the toroidal support and the delivery member to form said coils.

63. (New) The method as claimed in claim 44, further comprising the step of applying at least one third layer radially internal to said first layer, onto the toroidal support, which third layer is of an elastomer material cross-linkable with said first elastomer layer.

64. (New) The method as claimed in claim 44, further comprising the step of applying a fourth layer at a radially external position to said second layer, said fourth layer being of an elastomer material cross-linkable with at least said second elastomer material.

65. (New) The method as claimed in claim 44, wherein said first elastomer material comprises a polymeric butyl base and said second elastomer material comprises a polymeric silicone base.

66. (New) The method as claimed in claim 44, wherein during the bladder-vulcanising step at least one step of injecting elastomer material in said mould is carried out to form at least one additional coating layer on the bladder.

67. (New) A process for manufacturing tyres comprising the steps of:

building a green tyre;

inserting said green tyre into a mould;

supplying heat to said green tyre to obtain cross-linking of the elastomer material of which it is made;

moulding said green tyre against the walls of said mould through expansion of an expandable bladder placed within said tyre when the latter is enclosed in said mould; and

extracting a moulded and vulcanised tyre from said mould, wherein said expandable bladder has a toroidal conformation and comprises:

at least one first layer of a first elastomer material and one second layer of a second elastomer material different from said first elastomer material;

wherein said second layer is at a position radially external to said first layer;

wherein first and second layers have an undulated interface profile; and

wherein said interface profile defines mechanical-engagement elements between the first and second elastomer materials.

68. (New) The process for manufacturing tyres as claimed in claim 67, wherein said expandable bladder comprises at least one circumferential edge carrying anchoring tailpieces.

69. (New) A vulcanisation apparatus for tyres of vehicle wheels, comprising:

a mould having a plurality of cheeks and sectors adapted to define, by moulding, a tread pattern on the tread band of the tyre and a plurality of graphic marks on the sidewalls of the same tyre;

devices to supply heat to a green tyre to be vulcanised to enable cross-linking of the latter, said devices being operatively associated with said mould; and

an expandable bladder operatively associated with said mould to exert pressure from the inside to the outside on said green tyre, bringing said green tyre into contact with said cheeks and sectors of said mould during the moulding step, wherein the expandable bladder has a toroidal conformation and comprises:

at least one first layer of a first elastomer material and one second layer of a second elastomer material different from said first elastomer material;

wherein said second layer is at a position radially external to said first layer;

wherein said first and second layers have an undulated interface profile; and

wherein said interface profile defines mechanical-engagement elements between the first and second elastomer materials.

70. (New) The vulcanisation apparatus for tyres of vehicle wheels as claimed in claim 69, wherein said expandable bladder comprises at least one circumferential edge carrying anchoring tailpieces.